

# **EPA's Proposal to Reduce Methane Emissions from the Oil and Natural Gas Industry: Technical Overview**

## **Summary**

- On November 2, 2021, the U.S. Environmental Protection Agency (EPA) took an important step forward in addressing the climate crisis and protecting people's health through a proposed rule that would lead to significant, cost-effective reductions in emissions of methane and other harmful air pollution from the oil and natural gas industry.
- EPA's proposal would update and strengthen current requirements for new, reconstructed and modified "sources" in the oil and natural gas industry to reduce emissions of methane and smog-forming volatile organic compounds (VOCs). The proposal would broaden the types of sources covered by the rule, and it would encourage the development and deployment of innovative technologies to further reduce pollution from oil and natural gas sources. Sources are specific types of equipment, processes and activities that can emit methane and other pollutants.
- The Agency also is proposing Emissions Guidelines, which would require states to develop plans that limit methane emissions from existing oil and natural gas sources -- the first time EPA would require regulation of hundreds of thousands of existing sources across the country.
- EPA intends to issue a supplemental proposal in 2022 that will provide proposed regulatory text and may expand on or modify the 2021 proposal in response to public input. To inform this supplemental proposal, EPA is seeking information about additional sources of pollution that may help the Agency further reduce methane and VOC emissions from the oil and natural gas sector.
- EPA reviewed its current regulations in response to President Biden's Executive Order on Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis. In developing the proposal, EPA leveraged lessons from states' regulatory programs, voluntary programs and emission measurement campaigns across the country. The Agency also built on the work of leading companies that are using the latest science and technology to reduce methane emissions and considered information and ideas EPA heard from the public in the months leading up to the proposal, including from people living in communities near oil and gas operations.
- About one third of the warming from greenhouse gases that is occurring today is due to human-caused emissions of methane, a highly potent greenhouse gas and the main component of natural gas. The oil and natural gas industry emits a third of the total methane in the U.S. and is the country's largest industrial methane source.

- EPA’s proposal would reduce 41 million tons of methane emissions from the oil and natural gas industry between 2023 and 2035, the equivalent of 920 million metric tons of carbon dioxide. That’s more than the amount of carbon dioxide emitted in 2019 from all U.S. passenger cars and commercial aircraft combined. In 2030 alone, methane emissions from covered sources would be 74 percent lower than they were in 2005.
- These reductions are expected to yield \$48 to \$49 billion in climate benefits (2019\$, 3 percent and 7 percent discount rates, respectively) from the period 2023 to 2035, the equivalent of about \$4.5 billion dollars in benefits a year.
- Along with methane, the oil and natural gas industry emits VOCs, which contribute to the formation of ground-level ozone (smog) and fine particulate matter, both of which are harmful to health. The proposed rule would reduce an estimated 12 million tons of VOCs from 2023 to 2035.
- Oil and gas operations also emit carbon dioxide; sulfur dioxide; nitrogen oxide; hydrogen sulfide; and a number of pollutants known as “air toxics,” including benzene, formaldehyde, toluene, ethylbenzene and xylene. The proposed rule would reduce 480,000 tons of air toxic pollutants from 2023 to 2035.
- Also as part of today’s action, EPA is proposing amendments to its standards for new, modified and reconstructed sources to address inconsistencies between VOC and methane requirements in light of the recent joint resolution under the Congressional Review Act that disapproved the 2020 oil and gas “Policy Rule.”
- EPA will take comment on the proposed actions for 60 days after the proposal is published in the Federal Register. The Agency also will hold virtual public hearings.
- For more information, visit: <https://www.epa.gov/controlling-air-pollution-oil-and-natural-gas-industry>

### **Reducing Methane is a Critical Step Toward Slowing the Rate of Climate Change**

- The Earth's climate is changing. Greenhouse gases have warmed the atmosphere, ocean and land, leading to increases in heat waves, larger and more intense wildfires, more intense hurricanes and rainstorms, and rising sea level, among other effects. These changes, along with changes projected to occur in the future, threaten the physical survival, health, economic well-being and quality of life of people living in the U.S. – especially for low-income communities and communities of color, which are among the most vulnerable.
- According to the Intergovernmental Panel on Climate Change, strong, rapid and sustained methane reductions are critical to reducing disruptions of the Earth’s climate that may occur soon. Methane stays in the atmosphere for less time than carbon dioxide (CO<sub>2</sub>) but is much more efficient at trapping radiation. Over 100 years, 1 ton of methane in the atmosphere has nearly 30 times the warming impact of 1 ton of CO<sub>2</sub>. But in the first 20

years, that ton of methane has about 80 times the warming impact of a ton of CO<sub>2</sub>. This makes immediate methane reductions a powerful step toward reducing warming in the near future.

### **Setting Performance Standards: The Best System of Emission Reduction**

- Under section 111(b) of the Clean Air Act, EPA must set NSPS and Emission Guidelines for each type of source by applying the “best system of emission reduction,” or “BSER,” that the Administrator determines has been adequately determined. EPA is proposing BSER for each type of source covered by the rule as part of today’s action, including new, modified and reconstructed sources, and existing sources.
- To develop the proposed BSER, EPA evaluated potential control measures that are available for sources covered by the rule, along with the emission reductions those control measures could achieve. As required by the law, EPA also took into account the cost of achieving those emission reductions, along with “non-air” health and environmental impacts, and energy requirements.

### **Proposed Emissions Guidelines for Existing Sources**

- EPA’s proposal recognizes the unique role of states and tribes in addressing emission from existing sources. Once EPA issues an NSPS for certain pollutants, section 111(d) of Clean Air Act requires the Agency to issue regulations under which states submit plans to reduce emissions of those pollutants from existing sources in the same industrial category. EPA issues those regulations in the form of Emissions Guidelines.
- Emissions Guidelines do not impose requirements directly on sources. Instead, they establish procedures for states to follow as they develop plans that establish, implement and enforce performance standards for “designated facilities,” which is the term EPA uses for existing sources.
- EPA is proposing Emissions Guidelines for methane that provide states with clear guidance for developing plans while also giving states room to adopt their own approaches. The proposed guidelines include “presumptive standards” for the same types of facilities that are covered by the NSPS, with the exception of well completions and liquids unloading, which always are considered new or modified sources. Most of these presumptive standards, which are based on the BSER for existing sources, mirror the standards EPA is proposing for new sources. They are intended to provide the states with a starting point, much like a model rule, as they develop standards to include in their plans. EPA also is proposing BSER for existing sources as part of today’s action.
- EPA’s proposal also includes requirements for states to undertake meaningful outreach and engagement with overburdened and underserved communities as they develop their plans.

- Once the Emissions Guidelines are final, states must submit plans that establish standards that generally are as stringent as the presumptive standards. The proposal also provides states with flexibility to leverage their existing programs or develop new programs that are at least as effective as the presumptive standards.
- A state may choose to apply a less-stringent standard to a particular facility or type of facility, provided it makes certain demonstrations. Those demonstrations include unreasonable cost of control based on a source's age, location or basic design, and the physical impossibility of installing emissions control equipment, among others.
- Once a state adopts its plan, it must then submit it to EPA for approval and approval (states with no oil and gas operations must submit a letter certifying that they have no covered sources). If a state does not submit a timely plan, or if EPA disapproves a state plan, the Agency must issue a Federal Plan for that state.
- Existing sources located in Indian country would not be included in a state's plan. Eligible tribes would have the opportunity, but not the obligation, to develop their own plans that establish performance standards for existing sources on their tribal lands. If a tribe does not submit a plan, or if EPA does not approve a tribe's plan, then the Agency has the authority to establish a Federal Plan for that tribe.
- EPA expects to propose updates shortly in a separate rule to establish implementation timelines that will generally apply to all of EPA's future Emissions Guidelines under Clean Air Act section 111(d), including a deadline for states to submit plans to EPA for review once an Emissions Guideline is final. This separate proposal will include other general provisions for states and tribes to follow, such as how states may consider remaining useful life and other factors, as they develop their plans under the Emissions Guidelines.

### **Proposed and Presumptive Standards**

- EPA's proposed NSPS would expand and strengthen emissions reduction requirements that are currently on the books for sources that are constructed, modified or reconstructed after the date the proposed rule is published in the Federal Register. It also would broaden the sources covered by the rule.
- The proposal includes standards for greenhouse gas emissions (in the form of methane limitations) and standards for emissions of VOCs. The standards apply to equipment, processes and activities used in the production of crude oil and in the production, processing, transmission and storage of natural gas.
- The proposed standards for new sources, and presumptive standards for existing sources, include:

- **A comprehensive monitoring program to require companies to find and fix leaks** (known as “fugitive emissions”) at new and existing well sites and compressor stations.
  - **Well sites with estimated emissions of 3 tons per year** or would be required to monitor for leaks using optical gas imaging (OGI) or Method 21 quarterly and promptly repair any leaks found. EPA estimates sites emitting 3 tons or more per year are responsible for approximately 86 percent of all fugitive emissions from well sites. Leaks must be at least 60 days apart, but no more than four months apart.
  - **Well sites with estimated emissions of less than 3 tons per year** would be required to promptly conduct a survey (and perform repairs as needed) to demonstrate they are free of leaks or malfunctions but are not required to undertake ongoing monitoring.
  - EPA is co-proposing a requirement that sites with estimated emissions between 3 and 8 tons per year be monitored semi-annually, rather than quarterly.
  - Surveys must include inspections of equipment that is most prone to large leaks and malfunctions, including hatches on storage tanks and flares
  - **All new and existing compressor stations** would monitor and repair leaks on a quarterly basis.
  - **Sources on the Alaska North Slope** would have different monitoring schedules to account for weather.
- **Flexibility to use advanced methane detection technologies**
  - EPA is proposing to give owners/operators the flexibility to use **advanced methane detection technologies for leaks surveys at well sites** and compressor stations.
  - Any technology that meets a **rigorous minimum detection threshold** would be allowed.
  - Surveys using these advanced technologies would be required at least once every two months, and any leaks found would have to be repaired.
  - To ensure that smaller leaks are detected, these surveys must be supplemented by annual monitoring using optical gas imaging or EPA Method 21.
  - EPA is seeking comment and information on this approach, including **whether this advanced technology pathway is the “best system of emission**

**reduction” and should be required** for leaks surveys at well sites and compressor stations.

- The Agency also is seeking comments on how continuous monitoring technology could be used for leaks surveys.
- **New requirements for zero-emitting pneumatic controllers.**
  - EPA’s proposal would require all new and existing pneumatic controllers in production, processing, and transmission and storage facilities to have zero methane and VOC emissions, with the exception of sites in Alaska that do not have power.
  - The program also would regulate emissions from intermittent vent pneumatic controllers for the first time.
  - Natural gas-driven pneumatic controllers are used extensively in production, processing, and transmission and storage facilities. Natural gas emitted from these controllers accounts for nearly 30 percent of all methane emissions from oil and natural gas systems. The vast majority of these emissions come from intermittent controllers that are currently unregulated under the Clean Air Act. Multiple zero-emitting alternatives to these pneumatic controllers exist.
- **New requirements to eliminate venting of associated gas from oil wells**
  - EPA’s proposal would eliminate venting of associated gas from oil wells and require at least a 95 percent reduction in methane and VOC emissions from associated gas that cannot be captured and sold.
  - Oil wells frequently produce significant quantities of “associated” natural gas. In many areas, there is no sales line for this gas, so producers vent it or flare it. This venting, which is currently unregulated under the Clean Air Act, releases significant amounts of methane into the atmosphere (nearly 40,000 tons in 2019 alone).
  - EPA’s proposed requirements for new and existing sources include:
    - Producers must capture and send the gas to a sales line if one is available.
    - Where producers do not have access to a sales line, they must:
      - Use the gas for power on site or another useful purpose, such as raw material, or
      - Route it to a flare or control device that reduces methane and VOCs by 95 percent.

- Recordkeeping and reporting requirements would ensure that flares are operating properly.
- **Strengthened requirements for emissions from storage tanks**
  - EPA's proposal would strengthen requirements for storage tanks by adding tank batteries (groups of tanks that are adjacent and receive fluids from the same source) to the definition of facilities that must reduce VOC and methane emissions.
  - That update would require that new, modified or reconstructed tank batteries with potential VOC emissions of more than 6 tons per year to reduce emissions by 95 percent – the same amount currently required for individual tanks.
  - Under the proposed presumptive standard, existing storage tanks or tank batteries with a potential to emit of 20 tons of methane per year or greater must control their emissions by 95 percent.
  - EPA's proposal would strengthen compliance by including tank hatches or openings among the types of equipment that would have to be monitored for leaks.
- **Requirements for additional types of pneumatic pumps**
  - EPA's proposal would extend current requirements for new pneumatic pumps to include all natural gas-driven diaphragm and piston pumps in the production segment of the industry, and diaphragm pumps in the transmission segment. These standards require pneumatic pumps with access to an onsite control device to reduce emissions by 95 percent.
  - For existing sources, the presumptive methane standards for pneumatic pumps would mirror those proposed for the NSPS but exclude piston pumps.
- **The proposal also would:**
  - Establish nationwide requirements to minimize methane and VOC emissions from liquids unloading for the first time
  - Strengthen current leak detection and repair requirements for new natural gas processing facilities, and including those requirements as presumptive standards for existing sources
  - Strengthen standards for methane emissions from new reciprocating compressors, and including those requirements as presumptive standards for existing sources

- Add presumptive standards for existing centrifugal compressors that require 95 percent control of emissions from wet seal degassing, consistent with current standards for new sources
- Retain the 2016 standards for:
  - Sulfur dioxide emissions from sweetening units; and
  - Methane and VOC emissions from natural gas well and oil well completions.

### **Seeking Information to Further Reduce Methane**

- EPA intends to issue a supplemental proposal in 2022 that will provide proposed regulatory text and may expand on, or modify, the 2021 proposal in response to public input provided during the comment period on the proposal.
- To inform this supplemental proposal, EPA is seeking information about additional sources of pollution that may help the Agency further reduce methane and VOC emissions from the oil and natural gas sector, including:
  - Abandoned and unplugged wells;
  - Opportunities to improve performance and minimize malfunctions at flares;
  - Pipeline “pigging” operations; and
  - Tank truck loading operations.
- EPA also is seeking comment on how the Agency could provide a way to empower communities, regulators, and the public to assist in identifying and stopping large emission events by detecting and reporting them to owners/operators for follow up and mitigation.
- The Agency also is requesting comment on technologies that may be used as part of such a community monitoring program, how such large events should be documented and reported to companies, and what follow-up actions would be appropriate.

### **Additional Proposed Changes Related to the 2020 Technical Rule**

- EPA also is proposing several modifications to current requirements in the 2016 NSPS, including changes to address regulatory inconsistencies stemming from the recent joint resolution under the Congressional Review Act that disapproved the 2020 Policy Rule. That rule, which was issued by the previous Administration, had eliminated important requirements to reduce methane and other air pollution from new and modified sources in the oil and gas sector.



- The joint resolution did not address a separate 2020 rule known as the “Technical Rule.” This rule remains in place today.
- EPA is proposing to repeal amendments in the Technical Rule that:
  - Exempted low-production well sites from monitoring fugitive emissions; and
  - Changed VOC monitoring requirements at gathering and boosting compressor stations from quarterly to semi-annually.
- In addition, EPA is proposing to apply some of the amendments from the Technical Rule to methane standards for all segments of the oil and gas industry, and to VOC standards in the transmission and storage segment. Those amendments include requirements for well completions, pneumatic pumps, closed vent systems, fugitive emissions, alternative means of emission limitation (AMELs) and onshore natural gas processing plants, along with other technical clarifications and corrections.

**For more information**

- To read a copy of the proposal and additional fact sheets, visit:  
<https://www.epa.gov/controlling-air-pollution-oil-and-natural-gas-industry>